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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,703	07/09/2003	Stephen J. Benkovic	00-387-P	5892
20/306 7590 01/21/2010 MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP 300 S. WACKER DRIVE 32ND FLOOR CHICAGO, IL 60606				
EXAMINER KWON, BRIAN YONG S				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/615,703

Applicant(s)

BENKOVIC ET AL.

Examiner

Brian-Yong S. Kwon

Art Unit

1614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/01/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 52-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 52-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/308)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Application

1. Acknowledgement is made of applicant's amendment/remarks filed on 10/01/2009. By the amendment, claim 52 has been amended. Claims 52-61 are currently pending for prosecution on the merits.
2. Applicant's arguments have been fully considered but they are not deemed to be persuasive. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set of actions being applied to the instant application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
3. Claims 52-61 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (US 20050054644) or Benkovic et al. (US 20040259833).

This rejection is analogous to the previous rejection mailed 07/31/2008 and 04/02/2009. This rejection is maintained because the applicant has not effectively perfected priority claim

during the time period set forth in 37 CFR 1.78(a) and the petition filed 12/15/2009 has been dismissed in our PTO record.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The '644 or '833 PG-pub discloses a method of treating bacteria e.g., *Helicobacter* as the instant method utilizing the same boron containing compounds. The claimed inhibition of DNA methyltransferase is a property inherent to the compound used in the method, (see the '644 published application).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was

made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 52-61 are, as amended, are rejected under 35 U.S.C. 103(a) as being unpatentable Patel et al (5348947) in view of Vermeulen et al (5872104) and Barney et al (6068973) and Lonetto et al (6165762).

This rejection is analogous to the previous rejection mailed 07/31/2008 and 04/02/2009. This rejection is maintained because the applicant has not effectively perfected priority claim during the time period set forth in 37 CFR 1.78(a) and the petition filed 12/15/2009 has been dismissed in our PTO record.

Patel discloses throughout the patent at e.g., the claims a method of treating fungus by administering a diarylboron ester and thioester having the formula as shown at e.g., the abstract. Patel does not disclose that said diarylboron ester can treat a DNA methyltransferase mediated bacteria induced disease.

Vermeulen discloses throughout the patent at e.g., col. 3, lines 4-64:
A method comprising administering to an animal (including a human patient) that has, or is suspected to have a microbial or bacterial infection, a therapeutically effective amount of pharmacologically acceptable antimicrobial agent formulation in combination with a therapeutic amount of a pharmacologically acceptable formulation of a second agent effective to inhibit methylation, e.g., effective to inhibit RNA methylation. The invention may thus be employed to treat both systemic and localized microbial and bacterial infections by introducing the combination of agents into the general circulation or by applying the combination, e.g., topically to a specific site, such as a wound or burn, or to the eye, ear or other site of infection.

The "second agents" for use in the invention are generally methylation inhibitors, and are also referred to herein as "inhibitors" and "modifiers" The second agent inhibitors should be used in amounts effective to inhibit methylation in a microorganism or bacterium, as exemplified by an amount effective to inhibit RNA methylation, synthesis and/or maturation in an MLS-susceptible bacterium. Suitable amounts effective to inhibit methylation will be known, or readily identifiable, to those of skill in the art. Effective inhibitory amounts are the amounts that have previously been shown in the scientific literature to inhibit methylation generally or to inhibit a specific methylation step. In addition to the present disclosure and the references specifically incorporated herein, there is considerable scientific literature concerning methylation inhibitors that may be utilized in light of the inventors' discovery that such compounds may be effectively combined with antibiotics and other antimicrobial agents. Amounts effective to inhibit methylation may also be measured, rather than identified from the published literature. Most simply, this is achieved by determining the amount effective to increase microbial or bacterial killing when used in combination with an antimicrobial agent, i.e., by determining an amount effective to reduce antimicrobial resistance. The determinations of effective inhibitory amounts and therapeutic doses will be routine to those of skill in the art given the teachings of the present disclosure, including the detailed methodology and the effective amounts of various agents disclosed, e.g., in Table 8 and throughout the detailed examples.

Patel does not disclose bacteria. However, Vermeulen discloses in general bacteria and microbes.

Barney et al throughout the patent discloses the different bacterial species such as *Agrobacterium*, *Rhizobium* and *Helicobacter*. Accordingly, it would have been obvious to one

having ordinary skill in the art at the time the invention was made to treat bacteria or other microbes such as fungi in the method of Patel in view of Vermuelen's disclosure that not only bacteria are treated by inhibitors of DNA methylase but other microbes as well. One having ordinary skill in the art would know that a fungus is one type of microorganism(s) as taught by Vermuelen. Vermeulen teaches treatment of bacteria in general and does not seem to limit to those disclosed therein. It would be within the ordinary skill in the art at the time the invention was made to choose the specific bacteria depending upon the bacteria desired to be treated. The bacteria *Agrobacterium*, *Rhizobium* and *Helicobacter* are known to have been treated in the art whether via the mechanism of DNA methyltransferase inhibition or by other mechanistic pathway as evidenced by Lonetto et al, which discloses at e.g., col. 19, lines 50-67:

Helicobacter pylori (herein *H. pylori*) bacteria infect the stomachs of over one-third of the world's population causing stomach cancer, ulcers, and gastritis (International Agency for Research on Cancer (1994) Schistosomes, Liver Flukes and *Helicobacter Pylori* Moreover, the international Agency for Research on Cancer recently recognized a cause-and-effect relationship between *H. pylori* and gastric adenocarcinoma, classifying the bacterium as a Group I (definite) carcinogen. Preferred antimicrobial compounds of the invention (agonists and antagonists of apt) found using screens provided by the invention, particularly broad- spectrum antibiotics, should be useful in the treatment of *H. pylori* infection. Such treatment should decrease the advent of *H. pylori*-induced cancers, such as gastrointestinal carcinoma.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Claim is allowed.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Kwon whose telephone number is (571) 272-0581. The examiner can normally be reached Tuesday through Friday from 9:00 am to 7:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin Marschel, can be reached on (571) 272-0718. The fax number for this Group is (571) 273-8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications may be obtained from Private PAIR only. For more information about PAIR system,

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see <http://pair-direct.uspto.gov> Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Brian-Yong S Kwon/
Primary Examiner, Art Unit 1614